

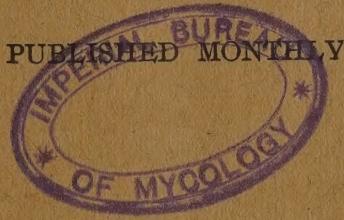
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INTERNATIONAL BULLETIN OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS IN WORLD PHYTOPATHOLOGY

Bermuda : A Disease of Bermuda Easter Lily and "Aster Yellows" (1).

A disease of the Bermuda Easter Lily or *Lilium Harrisii* (*Lilium longiflorum* var. *eximium*, Baker), known locally as "yellow flat" and characterised by extreme dwarfing, chlorotic colour and marked downward curling and twisting of the leaves, has been shown by L. OGILVIE, Plant Pathologist, to belong to the virus group and to be transmitted by the aphid *Aphis lili*, Takahashi. It is believed to occur on varieties of *Lilium longiflorum* in Japan and was probably largely responsible for the breakdown of the Bermuda lily industry about 1900. It has been the subject of strict regulation in Bermuda for the last three years, only one per cent. of the disease being allowed in the fields at the time of flowering.

Dove
Bermuda
Agri. Bu.
Malaria

During January, 1927, Aster Yellows was found by L. OGILVIE for the first time in Bermuda. It was transmitted experimentally by the leafhopper *Cicadula sexnotata*, Fall., recently shown by KUNKEL to be the vector of the disease.

Egypt : The Fusarium Disease of Cotton (Wilt) and its Control (2).

The wilt disease of cotton, which I prefer to call the Fusarium disease, because of the frequent absence of the wilting symptom in infected plants, has been studied at some length (1923-1926).

The disease was found prevalent in the fertile parts of the Delta (Lower Egypt) where in some localities it is so severe that many cultivators have given up growing the susceptible long staple varieties and have substituted for them short staple varieties resistant to this disease.

(1) Communication from the official correspondent to the Institute, Mr. Ernest Albert McCALLAN, Director of Agriculture, Department of Agriculture, Agricultural Station, Paget East, Bermuda.

(2) Communication from the official correspondent to the Institute, Mr. Tewfik FAHMY, Chief of the Mycological Research Division, Plant Protection Section, Giza, Egypt.

The disease, which attacks principally long staple cotton, of which Sakel is the principal variety and the one most grown in the Delta, was found to appear in the field in patches ; with the frequency of susceptible cotton growing the whole field may become involved. The symptoms consist of the mosaic appearance on the leaf, the death of the growing point and the dwarfed appearance of the infected plants. These symptoms may or may not be present. The symptom, which is always associated with the diseased plant, is a characteristic discolouration of the central cylinder of the root, which may extend upwards into the stem.

The parasite was studied morphologically and physiologically and found to be different from *Fusarium vasinfectum* Atk. causing the wilt disease in the U. S. A. and from *Fusarium* sp. causing the same disease in India.

On this evidence I call the *Fusarium* causing this disease in Egypt, *Fusarium vasinfectum* var. *aegyptiacum*.

The infective capacity of the soil was also studied and the parasite was isolated from layers as deeply buried as one meter. Infection was found to increase with the amount of organic matter present in the soil and the quantity of the parasite.

On dilute Richards solution, the parasite was found to produce a staining substance capable of causing wilting in healthy cotton seedlings.

The most important part of the work is that dealing with the selection of resistant plants.

Four strains of perfectly resistant Sakel of good lint-quality have been isolated after being grown for a number of years in heavily infected soil.

Italy: A Deterioration in Wheat reported in Piedmont, Emilia and Lombardy (1).

During May 1927 a serious deterioration in wheat was reported to the "R. Stazione di Patologia vegetale" of Rome from the provinces of Alessandria (Voghera), Parma, Brescia and Mantua following on frosts during April and especially on April 17 and 18.

The effects of this late cold spell are characterized by the fact that they remained unobserved for so long, the damage only becoming noticeable at the beginning of May in the yellowing and shrivelling of the leaves. This phenomenon is explained by the fact that in some of the wheat plants one of the lower internodes suffered immediate destruction, while in the vast majority of cases the cold caused in the stem the necrosis of small groups of sub-epidermal cells and the formation of hypertrophied cells, which later became disorganized, the fibrovascular bundles remaining intact and functioning perfectly.

The damage is not actually so great as seemed likely at the beginning of May.

(1) Communication from the "R. Stazione di Patologia vegetale" of Rome, official correspondent to the Institute.

VARIOUS QUESTIONS RELATING TO PLANT PROTECTION IN THE DIFFERENT COUNTRIES

INTERNATIONAL CONVENTIONS AND AGREEMENTS.

International Plant Protection Conference. — Following on the resolutions passed by the VIIth General Assembly of the International Institute of Agriculture, and after agreement with the Italian Government, the Permanent Committee of the Institute has decided to hold the International Plant Protection Conference early in November, 1928, at which time the meeting of the IXth General Assembly will also take place.

As has been already stated, the principal object of the Conference will be to decide upon the terms of the new International Convention for Plant Protection, which will be proposed in substitution of the "Acte final" of 4 March, 1914, as drafted by the International Conference of Phytopathology.

INTERNATIONAL COMMITTEES AND COMMISSIONS.

INTERNATIONAL INSTRUCTIONS REGARDING THE APPLICATION OF THE METHOD OF ARTIFICIAL CONTROL OF THE OLIVE FLY.

As was stated at the time (see No. 1 of this Review), the Olive Fly Section formed within the International Commission for Plant Protection — which, in its turn, is part of the International Scientific Council of the International Institute of Agriculture — during its first session, 18 and 20 November, 1926, requested Professor Antonio BERLESE, Director of the Royal Station of Agricultural Entomology at Florence and Chief Director of olive fly control in Italy, to draw up instructions for international use regarding the application of the method of artificial control of this insect.

In accordance with this request, Professor BERLESE has compiled and forwarded to the International Institute of Agriculture the following instructions :—

The method of olive fly (*Dacus oleae*, Rossi) control, which has been the subject of study and experiment in Italy for more than twenty years, and is to be known henceforward as the "Berlese Method", is founded on biological facts connected with the fly itself, and on simple and inexpensive means of turning to advantage certain conditions in which the insect is more vulnerable and may be exterminated on such a scale as to save the olive crop completely.

Fundamental Points of Protection against the Olive Fly.

(Olive Fly Control).

The Berlese method is based on the following principles:—

(1) The female of *Dacus* should be attacked first and should be destroyed in as large quantities and as extensively as possible, before she deposits her eggs.

(2) This destruction may be effected to the extent desired — that is, completely — by leaving in the olive-yard some substance which the fly will find attractive as a food, and which, containing a strong poison, will prove fatal. This poison bait should always be accessible to the insect in proper condition in the olive-yards that it is desired to protect, where there should be some present on each plant during the whole time in which the olive is liable to be injured by the fly.

(3) The fact that the adult insect is an excellent flyer must be taken into consideration. Hence arises its tendency to spread over the districts round the place where it was hatched, particularly in those directions where conditions are favourable for egg deposits.

To the above circumstance are due the continual migrations, even in swarms, of female flies towards other olive-yards sometimes at a considerable distance from their place of origin. For this reason even olive-yards artificially protected or in which the fly has not emerged owing to special local conditions, climate, season, etc. may be invaded ("reinvasion") and damaged by flies coming from other olive-yards in which they have emerged from the nymph stage. This fact makes it necessary that the olive-growers of any district who desire to protect their olives should be in touch with each other, and make a united effort towards the control of the olive fly.

Comments and Illustrations regarding the separate Fundamental Points mentioned above.

(1) Regarding the first point it should be noted that all efforts made hitherto towards the practical control of the olive fly, which were directed primarily in various ways against the young insect, and even imposed by law, have failed in their object.

It is necessary to attack the adult and, for this reason, each country must definitely ascertain the moment best adapted for this purpose so that the olive fly campaign for the season may be effectively begun.

Having determined, therefore, that the first emergence of female flies ("mother flies") takes place in olive-yards very early from the nymphs that have passed the winter in the earth, in stored olives etc., it is necessary to note, approximately for each country, the time of this emergence of mother flies. From this time the poisoned food may be given them without taking into consideration the stage of growth of the olive-trees.

Knowing, however, that the olive fly will be drawn by hunger and thirst towards sugary food and water, it should be taken into consideration that sugar (its food) is more eagerly sought by the fly at the time when it is scarce, and therefore more difficult to find in the olive-yards, i. e., it is more in request by the mother flies than by those of successive generations.

On the other hand, during the warm, dry season the best effect is obtained by giving very watery liquid.

In practice, it is necessary to offer the mother flies food containing a great deal of sugar; e. g. in small receptacles or "bacinelle" (special shallow saucer shaped poisoned food containers fixed in the tree). The poisoned preparation is rendered more efficacious by the addition of fruit containing a great deal of sugar, such as dried figs, even the decayed parts.

The same method of "reinforcement", that is to say of augmenting the efficacy, should be employed from the latter half of September until the gathering of the olives and, in this case, the seasonal fruit in a rotting, very suitable state is abundant and can be used with excellent effect particularly in the receptacles, and is most useful and convenient in the olive-growing regions where it abounds, viz., those which are farthest South.

On the other hand, for all the summer generations, from the beginning of the control measures (i. e. not later than the first half of June) to the middle of September, a large amount

of water is more efficacious than sugar, and this may be given more freely in the receptacles as also may beet molasses owing to its very hygroscopic nature, where it is very efficacious after nightfall if administered to the flies by spraying in heavy drops.

The most important fact, which has to be recognized in every olive-growing region is the date of susceptibility of the olive, that is the period when the olive during its early growth, is in the condition which allows the fly to deposit its eggs.

(2) The following poisonous mixture is effective against *Dacus* and is obtainable in sufficient quantities for olive fly control throughout an entire country, including those where the olive is most widely cultivated. It meets all requirements, not only those affecting the olive fly (proportion of sugar, hygroscopicity, density, poisonous qualities, etc.) but also those others related to agricultural practice in accordance with practical agriculture (economy, facility of distribution, etc.). This mixture is composed of :—

beet molasses	88 parts
sodium arsenite	2 "
water	8 "

The preparation of this mixture needs a certain amount of care and attention. Any person may make it for himself by thoroughly dissolving 2 kg. of sodium arsenite (*) in 8 litres of boiling water. This solution is poured slowly and stirring well into 88 kg. of beet molasses.

This produces a quintal of the concentrated mixture ready for the protection of the olive against the fly, which may be preserved from one year to another.

Many attempts have been made to replace the soluble arsenical salts by other substances less poisonous and dangerous.

The Royal Station of Agricultural Entomology of Florence has carried out a long series of investigations, in which trial has been made of substances which are poisonous to all animal organisms, and those destructive only to the Arthropods if introduced into the body by the mouth.

No substance has been found, other than among the soluble salts of arsenic, which is equally effective for agricultural use and particularly for the destruction of flies generally. Arsenites of copper, calcium, and lead cannot replace those of sodium or potash in the control of the olive fly.

There is still scope here for experiments which will render olive fly control more practical than ever, by eliminating the chief cause of criticism which can to-day be levelled against the best antifly preparations, namely their poisonous character.

Special care must be taken in the choice of the most suitable molasses to be used in this mixture.

It is necessary in the first place that the molasses should be derived from the beet sugar manufacturing process.

The molasses obtained from the cane sugar extraction process is, in fact, unsuitable for the destruction of flies of any kind, whether olive flies, house flies or otherwise.

Cane molasses is not hygroscopic, therefore it does not attract the fly during the greatest summer heat. It dries up in a few minutes, both in the drops sprayed, and in the special receptacles and has no effect on the insect.

Moreover, cane molasses is actually distasteful to the insect, which is never seen to hurry to it for a meal.

In the second place the molasses must contain not less than 40 % of sugar.

At the present time means are employed for the extraction of the sugar from molasses which remove it entirely.

There are therefore, molasses on the market which contain no sugar, and for this reason the molasses should be guaranteed before use for the destruction of olive-flies.

(*) It is necessary to make sure, by means of analyses made in competent laboratories, where a reliable guarantee can be given, that the arsenite contains at least 50 % of arsenous anhydride. This is necessary because arsenites with a much lower proportion of arsenous anhydride, and therefore quite inadequate for the purpose, are offered in many cases by dealers and also by associations who should have more consideration for the interests of the purchasers.

In addition, for the purpose of distribution of the mixture the molasses must have a density of at least 1.40. Otherwise the mixture will be too fluid and will lose many of the properties indispensable to its success (*).

(3) The olive fly is an essentially seaboard insect.

It will install itself from one year to another only in the coast plains. From here, as its numbers increase with successive generations, and prompted also by that very scarcity of the olive which is due to its own ravages, the fly tends to change and move further inland and towards more elevated zones, where it continues to live and establishes its last generation of the season. But the new home is not its natural one. It does not spend the winter there, and no trace of it is to be seen the following year.

Beyond this, given the adult's power of extensive and easy mobility as it passes actively at will from one plant to another, the olive fly is able to cover considerable distances and thus to pervade uniformly all the olive-yards over immense areas.

Hence, and in order that the pest may be dealt with in a methodical, rational, carefully prepared and well-timed manner, one and only one headquarters should direct the work of control over the entire zone needing protection.

In Italy the system of Associations ("Consorzi") prevails throughout the olive fly zones. These may be either communal or provincial (**).

Berlese Method of Protection against the Olive Fly (called also the spraying, the indirect Method, etc.).

300 gm. of a 10 % solution in water of the concentrated olive fly mixture is sprayed on to each olive tree by means of a single jet, using ordinary mildew sprayers.

The operation is easy, but success depends on attention to the following details:—

The solution in fresh water (10 % concentrated mixture, 90 % water) is made up on the spot as wanted for spraying on the plants, and a man stirs the liquid in solution all the time with a stick to prevent the concentration becoming greater at the bottom of the container.

The jet must be directed from below upwards. The whole plant need not be sprayed. It is advisable, also, to spray the mixture over only one part of the foliage, where the liquid should mainly be directed. The hand directing the jet should always be on the move so as to avoid covering only a few leaves and allowing an accumulation of liquid there, as such an excess of liquid might lead to the scorching of the leaves and of the delicate fruit.

In level plantations where there are no obstacles or other difficulties, a good workman, adequately helped by a man who keeps filling the sprayers, can spray about a thousand plants a day.

Whatever may be the dimensions of the olive tree, about 300 gm. of the solution sprayed in any one part of the foliage will suffice to protect it.

The fly, well winged, and always on the move, is competent on its own account to find on the foliage the drops of food offered to it.

The spraying has to be repeated as a rule at least three times between June and September so that the poisoned mixture may be on the olive tree, within reach of the fly, from the middle of June to the time when the olive is starting to ripen. This varies according to climate, the meteorological conditions of the season, the variety of the olive, the situation of the olive-yard, etc. The olive grower should take all this into consideration with regard to the particular olives he desires to protect from the fly.

(*) There is in Italy a large factory, where the mixture is prepared exactly in accordance with the formula given above, and every possible guarantee afforded as to the quality of the chemicals of which it is composed.

The mixture is guaranteed by the Società Nazionale degli Olivicoltori (Via della Panetteria, 27, Rome) which supplies all the Anti-olive fly "Consorzi" of Italy.

(**) For special notes regarding the "Consorzi antidiachici" in Italy, their statutes, regulations, and general proceedings, the reader is referred to the above-mentioned Società Nazionale degli Olivicoltori.

If the mixture on the olive should be diluted by rain the spraying should be repeated as soon as possible (*).

In any case, after remaining on the olive from 20 to 30 days, the concentrated mixture of poisoned molasses is exhausted and should be renewed.

Thus, by spraying for the first time between 20 and 30 June (without fail) and repeating the process at intervals of 20-30 days, even in the absence of rain during the season, each month until September, everything both necessary and possible for saving the olive crop will have been done and when gathered it will be found entirely free from the larva of the fly.

If the season has been such as to produce the rapid development of the olive, a spraying may be necessary even in the early days in October. This, in any case, is always useful, and well repays the expense incurred.

* * *

The following should be noted :

Before taking in hand olive-control measures, as indicated above, the plants must be examined for sooty mould. This mould, which spreads over the olives has no connection with the olive fly control spray. The presence of sooty mould certainly complicates olive control, as the fly prefers to feed on the honey-dew deposited by the scale insect (*Lecanium oleae*) which is always present in great numbers along with sooty mould. Wherever an olive-yard is thus attacked it must first be freed from sooty mould and scale insects before control measures against the olive fly can be carried out with any hope of success.

Also there should be no sweet fruits in the olive-yard. Olive-fly control measures are useless in olive-yards in the presence of fruit-trees (such as figs, vines, etc.) yielding sugary fruit, on whose juice, as it oozes from wounds in the fruit on the tree or fallen to the ground, the fly prefers to feed rather than on the poisoned molasses, and so escapes.

There need be no apprehension on behalf of bees whose hives are near the olive-yards or actually in the olive-yard itself, and there is no fear of their death by poisoning.

These insects, like all the Hymenoptera, unlike other insects, especially flies, always entirely avoid substances, even though sugary, which contain arsenic. On this point one can be reassured and without qualms.

The above are present day control measures in our power. They have been amply tried and scientifically tested for over twenty years in Italy and elsewhere, and give the certainty of completely saving the olive crop from the ravages of *Dacus oleae* (**), provided that the control operations, which are in themselves simple, are carried out carefully as has been indicated above and at suitable dates subject to small variations of time or otherwise considered opportune in the various regions of the olive growing zone in Europe and elsewhere, and quickly recognized by the expert.

Algeria : Situation at the Breeding-Places of *Dociostaurus maroccanus* in the three Departments in April 1927 (1).

DEPARTMENT OF ALGIERS. — The following communes are at present infested : Aïn-Boucif M., Aumale M., Boghari M., Boghari P. E., Chellala M., Bou-Saada M., and Sidi-Aïssa.

(*) This implies the adoption of measures for continuing to protect the olive even after rain or during a very rainy season. This is now done by arranging in the olive-yard special receptacles or "bacinelle" of the anti-fly mixture. These may be filled from tins containing the concentrated poisonous mixture, which is put on the market by the Olive Growers Co-operative Society, and so made that they may be cut in half so as to be divided out among the olive trees at the rate of two or rather more to the hectare. The Society supplies all the necessary instructions.

(**) The experience of many years has shown that *Prays oleaeillus* is completely defeated by means of the use of the sugary poison containing the mixture as recommended for the olive fly.

(1) Communication from the Governor General of Algeria to the President of the International Institute of Agriculture.

I.—The Mixed Commune of Aïn-Boucif.—This is the worst attack seen in Algeria for many years. The douars of Tittery, Tirghane, Birine, Kef Lakdar and Beddehar have been attacked and extensive damage has already been done to crops. Control measures are proceeding apace and large quantities of young locusts have already been destroyed. It is, however, likely that numerous insects will take their flight. Different processes of extermination have been used. At present only "melhafas" (cloth sheets used for collecting the young insects), barriers formed by sheets of zinc, and in the last resort, poisoned bait have been able to check the attack.

II.—The Mixed Commune of Aumale.—Hatching took place from 6 April onwards in the douars of Serdoun and Taguedide. At present a breeding-place still exists at "Mahzem Kebir" near the boundary of M'Sila. Three squads are working on extermination work which should be completely carried out in a few days.

III.—Mixed Commune of Boghari.—Young insects hatched in the douars of Boughzoul, M'Fatah, Ouled Aziz, and particularly Ouled Mareuf are being adequately treated by means of cresyl spraying, burning on alfa, and melhafas, which give excellent results. Large numbers of young insects have been destroyed.

IV.—Commune of Boghari P.E.—Hatching took place about 6 April in the place called "Aïn-Sebaa". Young insects were knocked into trenches where they were then sprayed with cresyl. A not very important breeding-place.

V.—Mixed Commune of Chellala.—Hatching was notified on 1 April in the places called "El Maya" and "Richa". The infestations, which were not of serious proportions, were dealt with as they arose, but at present the territory of this commune is being invaded by numerous young locusts which have escaped from extermination in Aïn-Boucif and Boghari. Special squads are working at the boundaries of these three communes.

VI.—Mixed Commune of Sidi-Aïssa.—New hatchings have taken place in the douars of Sidi-Aïssa, Tafraout and Zemlane. The breeding-places of Selamates, Tafraout, and Sidi-Aïssa have been destroyed. Several fairly important infestations still remain in the douars of Tafraout and Sidi-Hadjerès; control measures are in progress. Trial is to be made of poisoned bait as a control measure against the young insects in the crops. Excellent results have been achieved, thanks to burning on alfa, a practical measure of destruction.

DEPARTMENT OF CONSTANTINE.—Hatchings became general as from the beginning of April in the following communes: Ain-el-Ksar M., Ain M'Lila M., Belezma M., Chateaudun-du-Rhumel M., les Bibans M., les Eulma M., les Maadid M., les Rhira M., M'Lila M., and Tocqueville P. E.

VII.—Mixed Commune of Aïn-el-Ksar.—In this commune, which was said to be badly infected, the attack is less serious than that of 1926. Only one large breeding-place still exists in the douars of

Zoui and Oulad-Sidi-Ali on the borders of Chateaudun and Aïn-M'Lila. An active prosecution of present control measures will ensure the complete annihilation of this breeding-place. The employment of melhafas gives quite satisfactory results.

VIII.—Mixed Commune of Aïn-M'Lila.—All danger to crops has been removed by the energetic control measures carried out by M. ARRIGHI, the assistant administrator. The practically complete destruction of the young insects can be expected within a few days. Loss insignificant, despite considerable initial infection.

IX.—Mixed Commune of Belezma.—Attack insignificant compared with that of last year. Only one important infected area exists in the douar of Boughzel. The extermination of the young insects keeps pace with their hatchings. Control measures excellently carried out.

X.—Mixed Commune of Chateaudun-du-Rhummel.—This is at present the most seriously infected commune of the department and 900 men are working every day for the destruction of locusts. Up to the present about 10 hectares of cereals have been destroyed. The use of melhafas, as elsewhere, ensures considerable captures of the young insects. Flame projectors will shortly be used for destroying the worst infestations.

XI.—Mixed Commune of Les Bibans.—Young locusts hatched out on 16 March in the douar of Mansourah were destroyed fairly quickly, but it is to be feared that those coming from M'Sila will cause fresh infection of this commune.

XII.—Mixed Commune of Les Eullima.—Considerably less infection than the previous year in this commune which had collected in winter large quantities of egg-capsules. Squads are working at the boundary of Chateaudun to prevent the entry of young locusts from this commune.

XIII.—Mixed Commune of Les Maadid.—The situation as notified last month has improved considerably. Still, serious damage has been done and more than 1000 hectares of cereals have been ravaged. Considerable work has been achieved and the ground is thick with the bodies of dead insects. The use of melhafas here also has greatly helped the work. Poison bait has also given excellent results in this commune.

XIV.—Mixed Commune of M'Sila.—Control measures are in progress in the douars of Dreat, Kherabcha, and Ourthène. Excellent results have been obtained. Burning on beds of alfa and especially melhafas have been usefully employed.

XV.—Mixed Commune of Rhira.—Breeding-places are numerous in this commune but are not individually very important. Control measures have been rather more difficult owing to the spread of the breeding-places and of the initial lack of foremen for the control squads. Crops have suffered a certain amount of damage.

XVI.—Commune of Tocqueville P.E.—Very serious attempts were made to collect the eggs of locusts the deposits of

which had been noted in 1926 in this Commune. The number of egg-capsules so collected may be considered as 90%. In consequence the hatchings are negligible. Squads are working at the M'Sila and Maadid boundaries where the attack is more serious.

DEPARTMENT OF ORAN. — Hatchings have taken place in the following communes:— Berthelot P. E., Frenda M., Saida M., and Le Télagh M.

XVII. — Commune of Berthelot.— Hatchings have been notified on 3 April at places called Letteen and Posso Negro. Alfa being ready at hand, the young insects are being burned, while flame projectors are being used wherever the young locusts are in dense masses. Poisoned bait and melhafas especially are also used. The situation is very serious in this commune, where the most energetic control measures must be adopted to avoid considerable loss.

XVIII. — Mixed Commune of Frenda. — The most important breeding-places are round the new colonization centre of Tagremaret, in the douars of Guercha, Megrannis, and Ben Halima. Melhafas and poisoned bait have been used with success.

XIX. — Mixed Commune of Saida. — Hatchings have taken place in the douars of Houmet, L'Ircine, Doui Thabet. Young insects are few and their destruction is relatively simple. The usual methods of destruction employed are cresyl sprayings and burning on beds of alfa.

XX. — Mixed Commune of Le Télagh. — At Slissem the situation has greatly improved. Large quantities of young locusts have been destroyed by means of flame projectors, cresyl spraying, and especially melhafas. The destruction of the insects will be complete within a few days.

Egypt: see table on the next page.

Seychelles: Pests and Diseases of Coconut and Vanilla (1).

Coconut. — 1. Scale insects mostly *Pinnaspis buxi* and *Ischnaspis filiformis*.

2. A mild form of bud rot.
3. Little leaf disease.
4. Stem bleeding disease.
5. A beetle, *Melitomma insulare*, the larvae of which bore into trunks.
6. Another beetle, *Oryctes rhinoceros*, which attacks the cabbage.

Vanilla. — A root disease supposed to be due to an attack of *Catolospora Vanillae*.

(1) Communication from the official correspondent to the Institute, Mr. P. R. DUPONT, Director of Agriculture, Department of Agriculture, Victoria, Mahé, Seychelles.

Egypt: Additional List of Diseases of Economic Plants (1924-1925) (1).

Common Name of Host Plant	Scientific Name of Host Plant	Common Name of Disease	Name of Parasite	Range	Severity
Apple	<i>Malus sylvestris</i>	Crown Gall	<i>Bacterium tumefaciens</i>	Imported trees	Sometimes very serious
Citrus	<i>Citrus</i> sp.	Twig Gum Disease	<i>Fusarium</i> sp.	Mostly Lower and Middle Egypt	Serious on young trees
Clover	<i>Trifolium alexandrinum</i>	Powdery Mildew	<i>Erysiphe Polgoni</i>	Wide	Not serious
Cowpea	<i>Vigna sinensis</i>	Rust	<i>Tromyces Vignae</i>	Middle and Lower Egypt	Sometimes very serious
Haircot Beans	<i>Phaseolus vulgaris</i>	Rust	<i>Uromyces appendiculatus</i>	Mostly Lower Egypt	Sometimes very serious
Kaki	<i>Diospyros Kaki</i>	Crown Gall	<i>Bacterium tumefaciens</i>	Imported trees	Very serious
Maize	<i>Zea Mays</i>	Maize Smut	<i>Ustilago Zeae</i>	Very rare	Not serious
Melon	<i>Cucumis Dudaim</i>	Wilts Disease	<i>Fusarium</i> sp.	Lower and Middle Egypt	Sometimes severe
Okra	<i>Hibiscus esculentus</i>	Mildew	<i>Erysiphe Cichoriacearum</i>	Lower and Middle Egypt	Not serious
Palm	<i>Phoenix</i> sp.	Palm Leaf Smut	<i>Graephodia Phoenixis</i>	Lower and Upper Egypt	Not serious
Peach	<i>Prunus Persica</i>	Powdery Mildew	<i>Sphaerotheca pannosa</i>	Lower Egypt	Not serious
Prunus Varieties	<i>Prunus</i> spp.	Crown Gall	<i>Bacterium tumefaciens</i>	Imported trees	Sometimes serious
Rose	<i>Rosa</i> spp.	Downy Mildew.	<i>Peronospora sparsa</i>	Lower and Middle Egypt	Not serious
Safflower	<i>Carthamus tinctorius</i>	Powdery Mildew	<i>Sphaerotheca pannosa</i>		
Sunflower	<i>Helianthus annuus</i>	Rose Leaf Blotch	<i>Acinomyces Rosae</i>	Upper Egypt	Not serious
Water-melon	<i>Citrullus vulgaris</i>	Rust	<i>Puccinia Castanii</i>	Lower Egypt	Not serious
		Powdery Mildew	<i>Puccinia Helianthi</i>	Lower and Middle Egypt	Not serious
		Downy Mildew	<i>Erysiphe Cichoriacearum</i>		
		Wilts Disease	<i>Plasmopara Cubensis</i>		
Wheat	<i>Triticum</i> sp.	Mould	<i>Fusarium</i> sp.	Sometimes serious	Not serious
			<i>Cladosporium herbarium</i>	Lower Egypt	Not serious

(1) Communicated by Mr. Tewfik PARMY, Chief of the Mycological Research Division, Ministry of Agriculture, Egypt, official correspondent to the Institute. The above data complete and bring up to date those contained in the list and the two supplements, which dealt respectively with 1923 and 1924, and were duly communicated to all countries adhering to the Institute.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Austria (Burgenland) (1). — In pursuance of Federal Law (B. G. Bl. Nr. 215), of 28 July, 1926, the Burgenland Diet ("Landtag") has passed Law (L. G. Bl. Nr. 31), of 4 December, 1926, dealing with control measures against wart disease (*Synchytrium endobioticum*). It is now made incumbent on landlords, plant protection organizations, market police officials, agricultural corporations, instructors, etc. immediately to notify outbreaks of wart disease to the head of the commune.

In the case of a notification of the first outbreak of wart disease within a 5 km. radius, the person responsible is entitled to a reward of 50 schillings. A farmer who himself sends notification of an outbreak of wart disease can claim compensation for part (at most half) of the loss which he may be considered to incur in his occupation by carrying out the official wart disease control measures. The officials and representatives of the Plant Protection Institute are entitled to examine potato fields and stores directly an outbreak occurs.

Owners of fields or stocks must render gratis to the representatives of the officials or of the Plant Protection Institute, on demand, samples of plants and tubers and give without reserve all the information requested about their potatoes.

Where an outbreak of wart disease is suspected the Provincial Government is responsible for sending a properly packed sample of the suspected plants or plant parts to the Federal Institute for Plant Protection at Vienna. If the suspicion is confirmed, an enquiry is instituted for determining the area infected and its extent.

Points to be settled by the enquiry are:— Whether the particular potato field or stock shall be declared infected or suspect, what varieties are concerned, whether, when and to what extent has the owner already disposed of the diseased or suspect potatoes, and whether the possibility of using the potatoes in question can be entertained. A report on the result of the enquiry must be supplied to the offices of the Provincial Government, to the rural district office and to the Federal Institute of Plant Protection at Vienna. These bodies are then responsible for taking the necessary measures.

Wart-diseased or suspect potatoes may not be used for "seed" and may only be used for human or animal consumption after cooking and on the farm where grown. Only in exceptional cases, and subject to the most stringent precautions, may the Provincial Government sanction their use industrially or in any other way. Fragments and remnants of diseased plants or parts of plants must be burnt or cooked before being fed. Soil,

(1) The countries are arranged in the French alphabetical order.

liquid and farmyard manure and compost must not be removed from an infected farm. Where the potatoes cannot be used they must be well sprinkled with milk of lime and buried deep.

Only wart-resistant varieties may be planted on fields declared infected, and seed potatoes from these can again only be used on areas declared infected. The Provincial Government has the right to limit potato growing to wart resistant varieties for an area in the neighbourhood of an infected field to be determined in each case.

The law finally gives directions as to declarations of freedom from infection of potato stores or fields previously declared infected, the disinfection of stores, the suspension or modification of prohibited areas, the penalties for contraventions of the regulations of the law, the payment of the expense involved in the enquiry and in the necessary control measures for the execution of the law's requirements. (*Landesgesetzblatt für das Burgenland, Sauerbrunn, 24. März 1927, Jahrg. 1927, Stück II, S. 73-76*).

Dutch East Indies. — As from 15 November, 1926 live plants or live parts of plants, fruits, and seeds exported from all foreign countries (including Holland itself) to the Dutch East Indies, must be accompanied by a certificate issued by a Government expert belonging to the country of origin, stating that the products are free from diseases or insect pests.

The inspection of fresh fruits may be made at Tandjong Priok, Medan (Belawan-Deli), Semarang, Soerabaja and Macassar; that of plants and seeds only at Tandjong and Medan (Belawan-Deli).

Potatoes coming from Holland, Germany, Belgium, Poland, England and Wales, Ireland, Scotland, the United States of America and Canada, must be accompanied by the certificate above mentioned and also by a declaration of a Government expert of the country of origin stating that the potatoes are free from wart disease (*Synchytrium endobioticum*) and that they have been cultivated at a distance of at least 500 metres from tubers attacked by that disease.

A special list is given of plants, and also of fruits and seeds, which are exempt from phytopathological inspection and also from the necessity of the certificate from the country of origin.

The importation from all South American countries of plants or parts of plants, including the seeds, of *Hevea brasiliensis* is forbidden. (*Model II. Information for Importers of Plants, Cuttings, Bulbs, Tubers, Seeds and Fruits into Netherlands East India [Abstract of the Ordinance of the Governor General of Netherlands East India No. 26 dd. 27 Sept. 1926, and of the Decree of the Director of Agriculture, Industry and Commerce no. 9760/A. Z. dd. 3 Nov. 1926. Issued by the Institute of Plant diseases Buitenzorg, Java, November 1926], 2 pp.*).

Italy. — By a Decree dated 9 March, 1927 the Minister of the Interior has approved various provisions concerning the employment of poisonous gases, the Regulations for which were authorized by Royal Decree No. 147 of 9 January, 1927. (*Gazzetta ufficiale del Regno d'Italia, Roma, 13 maggio 1927, anno 68°, n. III, pp. 1991-1998*).

* * By the Royal Decree-Law, No. 819, of 19 May, 1927, while the prohibition of the use of the shot-gun remains in force, the Regulations of the Royal Decree-Law, No. 854, of 20 May, 1926, relating to sparrow-catching, but solely so far as relates to wheat-growing areas, are confirmed up till 14 August, 1927. (*Gazzetta ufficiale del Regno d'Italia*, Roma, 3 giugno 1927, anno 68^o, n. 128, pp. 2275-2276).

New Zealand. — The following regulations under the Orchard and Garden Diseases Act were gazetted on 3th January, 1927, and came into force on that date:—

1. For the purposes of these regulations, unless inconsistent with the context, "Inspector" means any Inspector appointed under the Orchard and Garden Diseases Act, 1908; "prescribed area" means all that portion of New Zealand comprising the counties of Eden, Waitemata, Rodney, Otamatea, Hobson, Whangarei, Bay of Islands, Hokianga, Whangaroa, and Mongonui, and all boroughs and town districts enclosed by or adjacent to the said counties, or any of them; "vine" means any vine of the genus *Vitis*, and any portion thereof excepting the fruit; "fungus" means the fungus known as downy mildew [*Plasmopara viticola*]; "insect" means the insect known as *Phylloxera vastatrix*.
2. No person shall remove any vine, fungus, or insect from any portion of the prescribed area to any other portion of New Zealand.
3. No person shall remove any vine bearing fruit, leaves, or immature wood, or which has earth adhering to its roots, or any fungus or insect, from any portion of the prescribed area to any other portion thereof: Provided that the provisions of this clause shall not be held to prohibit the removal of vines within the boundaries of the property on which they are growing.
4. No person shall remove any vine from that portion of the prescribed area comprising Waitemata County to any other portion of the prescribed area, unless accompanied by a certificate signed by an Inspector declaring that such vine has been disinfected as directed by him and to his satisfaction.
5. Nothing in these regulations shall be deemed to apply to an Inspector in respect to his sending any vine, fungus, or insect beyond the boundaries of the prescribed area for the purpose of the identification of disease.
6. Every person commits an offence against the above-mentioned Act who directly or indirectly, by himself, his servant, or agent, fails faithfully to observe and perform any duty or obligation imposed on him by this Order in Council, and is liable to a fine not exceeding twenty pounds. (NEW ZEALAND DEPARTMENT OF AGRICULTURE. *The New Zealand Journal of Agriculture*, Wellington, 1927, vol. XXXIV, no. 2, p. 143).

Union of South Africa. — Under the terms of Proclamation No. 12 of 1927, dated 4 January, 1927, and in accordance with paragraph (c) of Section 14 of the Agricultural Pests Act, 1911 (Act No. 11 of 1911)

the Province of Natal and Zululand become a restricted area in the matter of sugar cane cultivation.

In the annexure to this Proclamation it is laid down:— From and after 30 June, 1927, no person shall remove, or cause to be removed, except by the special permission of an officer appointed by the Minister of Agriculture, any sugar cane plant or any part of sugar cane plants of any variety other than the variety Uba from any place within the restricted area to any place either within or outside this area.

The expression "variety Uba" means any sugar cane plant which has the characters of leaf and stalk of the cane recognized in Natal as Uba, and has not been raised from seed cane derived from any plot or field certified by the Government Mycologist as wholly or partly infected with Mosaic Disease.

For the same Province and under Section 28 of the above Act (No. 11 of 1911) the following Regulations (*No. 64) will come into force:—

(1) "Variety Uba" shall be as laid down above.

(2) From and after the date of publication of these Regulations (14 January, 1927) no person shall plant or cause to be planted in the Province of Natal and Zululand any sugar cane of a variety other than the variety Uba without a written permit from an officer appointed by the Minister of Agriculture.

(3) From and after 30 June, 1927 no person shall keep or cause to be kept in the said area any sugar cane of a variety other than the variety Uba without a written permit from an officer appointed by the Minister of Agriculture.

(4) Where under Sub-section (2) of Section 15 of Act No. 11 of 1911 the Minister specially empowers an officer to take such steps as may be necessary for eradicating the disease on any premises, the said officer may require by 14 days notice the destruction of sugar cane of any variety other than Uba, and the destruction shall be carried out in the manner prescribed in the said notice. (*Proclamation No. 12, 1927 [of the Union of South Africa], [Pretoria], 4 January, 1927, 1 p., and Regulations * No. 64 [of the Union of South Africa], [Pretoria], 14 January, 1927, 1 p.]*).

RECENT BIBLIOGRAPHY

Alonso Rodríguez, Julian. El «gusano» de las azufaifas (*Carpomyia incompleta* Bécker). *Boletín de la Estación de Patología Vegetal*, Madrid, 1927, año I, num. 4, págs. 140-143, figs. 1-3.
[Azufaifas = drupes of *Zizyphus vulgaris* Lam.]

Bailey, D. L. and Greaney, F. J. Field experiments on the control of stem rust by sulphur dust. *Scientific Agriculture*, Ottawa, Ont., 1927, vol. VII, no. 5, pp. 153-156.

[*Puccinia graminis* Triticis (Pers.) Erikss. et Henn.].

Barnes, D. F. and Potts, S. F. Airplane dusting experiment for gipsy moth control. *Journal of Economic Entomology*, Geneva, N. Y., 1927, vol. 20, no. 1, pp. 213-222, fig. 10.
[*Porthezia dispar*].

Benton, R. J. Fumigation of Citrus trees. The 1926 trials with calcium cyanide. *The Agricultural Gazette of New South Wales*, Sydney, 1927, vol. XXXVIII, part 1, pp. 77-80.

Bolívar, I. Datos complementarios sobre los Ortópteros de la Península Ibérica. II. Grilidos. *Boletín de la Real Sociedad Española de Historia Natural*, Madrid, 1927, tomo XXVII, núm. 2, págs. 97-110.

[Described as new to science 1 sub-genus, 1 species, 1 sub-species and 2 varieties].

Boyce, J. S. Observations on forest Pathology in Great Britain and Denmark. *Phytopathology*, Lancaster, Pa., 1927, vol. 17, no. 1, pp. 1-18.

[*Phomopsis Pseudotsuga* Wilson, *Rabdocline Pseudotsugae* Syd. and *Chermes cooleyi* Gill. on *Pseudotsuga taxifolia* (Lam.) Br.; *Dreyfusia nusslini* Börner on *Abies pectinata* DC.; *Rehniellopsis bohemica* Bub. et Kab. on *Abies* spp.; *Brunchorstia destruens* on *Pinus* spp.; *Cronartium ribicola* (Fischer) on *Pinus Strobus*; *Meria Laricis* Vuill. and *Dasyoscypha calycina* (Schum.) on *Larix*; *Keitelia thujina* on *Thuja plicata* Don.; *Armillaria mellea* (Wahl.) Quél. and *Fomes annosus* (Fr.) Cke. on various Conifers].

Broadbent, B. M. Further observations on the life history, habits, and control of the *Narcissus* bulb fly, *Merodon equestris*, with data on the effects of carbon disulphide fumigation on three bulb pests. *Journal of Economic Entomology*, Geneva, N. Y., 1927, vol. 20, no. 1, pp. 94-113.

[*M. equestris*, *Eumerus strigatus*, *Rhizoglyphus hyacinthi*].

Brown, NELLIE A. Sweet pea fascination, a form of crowngall. *Phytopathology*, Lancaster, Pa., 1927, vol. 17, no. 1, pp. 29-30, pl. I-II.

[*Bacterium tumefaciens*].

Burgess, A. F. Some problems in economic Entomology. *Journal of Economic Entomology*, Geneva, N. Y., 1927, vol. 20, no. 1, pp. 67-68.

Caffrey, D. J. and Worthley, L. H. A progress report in the investigations of the European corn borer. *United States Department of Agriculture, Department Bulletin No. 1476*, Washington, D. C., 1927, 154 pp. 53 figs.
[*Pyrausta nubilalis* Hüb.].

Caillol, H. Observations sur *Hypéra salviae* Schrank. *Comptes rendus des séances de la Société de Biologie et de ses filiales*, Paris, 1927, tome XCVI, no 9, p. 660.

[The larva of *H. salviae* has been noticed as injurious to the leaves of *Primula officinalis*, Jacq.].

Childs, LEROY and Barss, H. P. Orchard spray program for the Pacific Northwest. *American Fruit Grower Magazine*, Chicago, Ill., 1927, vol. XLVII, no. 2, pp. 30-31.

Ciferri, RAFAEL y González Frágoso, ROMUALDO. Hongos parásitos y saprófitos de la República Dominicana (9.ª serie). *Boletín de la Real Sociedad Española de Historia Na-*

tural, Madrid, 1927, tomo XXVII, n.º 2, págs. 68-81, figs. 1-16.

[Contains among others, *Uredo Eichhorniae* n. sp. ad interim on *Eichhornia crassipes*; *Didymella dominicana* n. sp. ad interim on a not determined Lauraceae; *Arcangelia Roureae* n. sp. ad interim on *Rourea surinamensis*; *Phyllosticta Guaiacii* n. sp. ad interim on *Guaiacum officinale*; *Phyll. Canangae* n. sp. ad interim on *Cananga odorata*; *Phyll. dipterixicola* n. sp. ad interim on *Dipterix punctata*; *Ascochyta Melicoccae* n. sp. ad interim on *Melicocca bijuga*; *Asc. Rhizophorae* n. sp. ad interim on *Rhizophora* sp.; *Septriora Melicoccae* n. sp. ad interim on *Melicocca bijuga*. *Leptostroma Colae* n. sp. ad interim on *Cola vera*; *Oidium erysiphoides* Fr. f. n. on *Crotalaria* sp.; *Cercospora Solani-torvi* a. sp. ad interim on *Solanum torvum*].

Cleveland, C. R. Stomach poisons for control of the squash vine borer (*Melittia satyriniformis* Hbn.). *Journal of Economic Entomology*, Geneva, N. Y., 1927, vol. 20, no. 4, pp. 135-143.

Cory, ERNEST N. and McConnel, H. S. *Laspeyresia molesta* as an apple pest. *Journal of Economic Entomology*, Geneva, N. Y., 1927, vol. 20, no. 4, pp. 190-192.

Costantin, J. Un programme pour la lutte contre la dégénérescence des pommes de terre. *Annales des Sciences Naturelles*, Dixième série : Botanique, Paris, 1927, tome IX, fasc. 1, p. 281-284.

Curran, C. H. Recommendations and directions for the control of stored product insects under indoor conditions. *Scientific Agriculture*, Ottawa, Ont., 1927, vol. VII, no. 5, pp. 166-169.

Curzi, M. La Patologia vegetale al Congresso delle Scienze di Bologna (30 ottobre-5 novembre 1926). *Rivista di Patologia Vegetale*, Pavia, 1927, anno XVII, nn. 1-2, pp. 20-24.

[Contains the following chapters: Prime osservazioni su alcuni casi di "mal del pioppo". - Di uno speciale parassitosismo dell'*Ascochyta Syringae*. - La *Phytophthora* della "cancrena pedale" del *Capsicum annuum*. - Le intumescenze e il *Cladosporium Pisi* sui legumi di *Pisum sativum* (in collaboration with M. Barbaini)].

Curzi, MARIO. L'ezioologia della "cancrena pedale" del *Capsicum annuum* L. *Rivista di Patologia Vegetale*, Pavia, 1927, anno XVII, nn. 1-2, pp. 1-19, fig. 1-5.

[From plants of *C. annuum* affected by the disease a *Phytophthora* species has been isolated described as new under the name of *Phyt. hydrophila*].

Cuscianna, NICOLÒ. Acidio ciandrino come mezzo di lotta contro la "bianca-rossa". Trattamenti eseguiti nei giardini di Villa Celimontana a Roma. *Il Coltivatore*, Casale Monferrato, 1927, anno 73, n. 8, pp. 245-249.

[*Chrysomphalus dictyospermi* var. *pinnulifera* (Mask.)].

del Cañizo, José. Mezcla de insecticidas y cryptogamicidas. *Boletín de la Estación de Patología Vegetal*, Madrid, 1927, año I, n.º 4, págs. 147-149, 1fig.

Dustan, A. G. The artificial culture and dissemination of *Entomophthora sphaerosperma* Fres., a fungous parasite for the control of the European apple sucker (*Psyllia mali* Schmidb.). *Journal of Economic Entomology*, Geneva, N. Y., 1927, vol. 20, no. 1, pp. 68-75, pl. I.

Escherich, K. Neuzeitliche Bekämpfung tierischer Schädlinge. Rückblicke und Ausblicke. Berlin, Julius Springer, 1927, 32SS.

Faris, JAMES A. Zonate foot rot of sugar cane. *Phytopathology*, Lancaster, Pa., 1927, vol. 17, no. 2, pp. 83-94, fig. 1-10.

[Disease of a not determined origin, observed in Cuba (provinces of Camagüey and of Oriente)].

Faris, J. A. and Allison, R. V. Sugar cane root disease in Cuba: a progress report upon the root disease situation in 1925. *Phytopathology*, Lancaster, Pa., 1927, vol. 17, no. 2, pp. 61-82, fig. 1-11.

[Disease mainly of a physiological nature].

Felt, E. P. Insect pests newly established in New York State. *Journal of Economic Entomology*, Geneva, N. Y., 1927, vol. 20, no. 1, pp. 63-67.

[*Popillia japonica* Newm., *Anomala orientalis* Waterh., *Asperis castanea* Arrow, *Fenusia pumila* Klug., *Forficula dispars* L., *Diatrichomyia hypogaea* Lw., *Pyrausta nubilalis* Hb., *Diprion similis* Hartig, *Hemerophila pariana* Clerck, *Laspeyresia molesta* Busck, *Vespa crabro* L., *Eovesia buoliana* Schiff., *Monarthropalpus buxi* Labl., *Forficula auricularia* L., *Physokermes piceae* Schr., *Haplitolita limosipennella* Dup.].

Floyd, W. L. Spraying and dusting calendar for Florida. *American Fruit Grower Magazine*, Chicago, Ill., 1927, vol. XI, VII, no. 2, p. 26.

- Frost, S. W.** Further studies of baits for oriental fruit moth control. *Journal of Economic Entomology*, Geneva, N. Y., 1927, vol.20,no.1, pp.167-174,fig.8,pl.2.
[*Laspeyresia molesta*].
- Garman, PHILIP.** The problem of curculio control on Connecticut apple orchards. *Journal of Economic Entomology*, Geneva, N. Y., 1927, vol. 20,no.1,pp.196-199.
[*Conotrachelus nemophar*].
- Gibson, ARTHUR.** International Entomology — Retrospective and prospective. *Journal of Economic Entomology*, Geneva, N. Y., 1927,vol.20, no.1,pp.47-62.
- Gil, A.** Estudios sobre la alimentación de las aves. I. Examen del contenido estomacal de 58 aves de Candeleda (Avila). *Boletín de la Real Sociedad Española de Historia Natural*, Madrid, 1927, tomo XXVII, núm.2,págs.81-96.
- Griswold, GRACE H.** Observations on the biology of a new Geranium aphid (*Macrosiphum cornelli* Patch). *Journal of Economic Entomology*, Geneva, N. Y., 1927,vol.20,no.1,pp.91-94.
- Guyton, T. L.** Notes on the occurrence of *Luperodes thorasicus* as an insect pest of fruit trees. *Journal of Economic Entomology*, Geneva, N. Y., 1927,vol.20,no.1,pp.193-194.
- Hartley, CARL.** Notes on *Hibiscus* diseases in West Africa. *Phytopathology*, Lancaster, Pa., 1927, vol.17,no.1,pp.25-27.
[*Bacterium Solanacearum*, *Sclerotium Rolsii*, *Collectotrichum Hibisci*, *Heterodera radicicola*, etc. on *Hibiscus cannabinus*].
- Hartzell, ALBERT and Wilcoxon, FRANK.** The arsenic content of sprayed apples. *Journal of Economic Entomology*, Geneva, N. Y., 1927,vol.20, no.1,pp.204-212,fig.9.
- Headlee, THOMAS J.** An operation in practical control of codling moth in a heavily infested district. *Journal of Economic Entomology*, Geneva, N. Y., 1927, vol.20,no.1,pp.158-166.
[*Carpocapsa pomonella*].
- Hoffman, WM. A.** Damage to potato by *Pycnoscelus surinamensis*. *Journal of Economic Entomology*, Geneva, N. Y., 1927,vol.20,no.1,p.237.
- Hugues, ALBERT.** Les moineaux dans le Gard. *Revue Française d'Ornithologie*, Paris, 1927,série II, 19^e année, n° 214,p.50-52.
- Johnston, C. O.** Effects of soil moisture and temperature and of dehulling on the infection of oats by loose and covered smuts. *Phytopathology*, Lancaster, Pa., 1927, vol.17,no.1,pp.31-36.
[*Ustilago Avenae*, *U. levis*].
- Knight, HARRY H.** Notes on the distribution and host plants of some North American Miridae (Hemiptera). *The Canadian Entomologist*, Orillia, 1927,vol.LIX,no.2,pp.34-44.
- Kramer, OTTO.** Die Bekämpfung der Rebenschädlinge in Würtemberg im Jahre 1926. *Wein und Rebe*, Mainz, 1927, 8. Jahrg., Nr. 9, S.379-407.
- Lang, W. und Arker, H.** Beobachtungen über die Hopfen-Peronospora im Jahre 1926 (Schluss). *Nachrichtenblatt für den Deutschen Pflanzenschutzdienst*, Berlin, 1927, 7.Jahrg., Nr.3,S.27-28.
- Larson, A. O.** The automobile vs. insects. *Entomological News*, Philadelphia, Pa., 1927, vol.XXXVIII, no.3,pp.65-70.
- Linford, MAURICE B.** Additional hosts of *Aphanomyces euteiches*, the pea rootrot fungus. *Phytopathology*, Lancaster, Pa., 1927, vol.17,no.2,p.133-134.
[According to tests made at Wisconsin, *A. euteiches* attacks, besides *Pisum sativum*, *Medicago sativa*, *Melilotus alba*, *Lathyrus odoratus*, *L. latifolius*, *Lathyrus* sp., *Vicia sativa*, *V. pannonica*, *V. monantha*, *V. gigantea*, *V. julgens*, *V. Ervilia*, *V. dasycarpa* et *V. angustifolia*].
- Lo Curlo, S.** Un nuovo nemico dei pistacchi. *Il Coltivatore Siciliano*, Catania, 1927, anno VI,no.2,pp.41-42.
[*Ceroplastes sinensis*].

Luginbill, Philip. The cotton worm in Michigan. *Journal of Economic Entomology*, Geneva, N. Y., 1927, vol. 20, no. 1, p. 236.
[*Alabama argillacea* Hbn.].

Mangin, L. La maladie verrueuse de la pomme de terre. *Le Progrès agricole et viticole*, Montpellier, 1927, 48^e année, no 13, p. 324-326.
[*Synchytrium endobioticum*.]

Manter, J. A. Charts and forms as aids in teaching economic Entomology. *Journal of Economic Entomology*, Geneva, N. Y., 1927, vol. 20, no. 1, pp. 76-78.

Marié, P. Les méthodes culturales et leur emploi en Entomologie agricole. *Bulletin de la Société des Agriculteurs de France*, Paris, 1927, 59^e année, no 1, p. 4-6.

Marshall, Guy A. K. New injurious Curculionidae (Col.). *Bulletin of Entomological Research*, London, 1927, vol. XVII, part 3, pp. 199-218 fig. 1-2, pl. XIX.

[*Blosius bataiae* n. sp. on *Bataia edulis* in Transvaal; *Mimaulodes hirtulus* n. sp. on melos plants in Transvaal; *Protostrophus gonoderes* n. sp. on the vine in the Orange Free State; *P. consobrinus* n. sp. on almond-trees in Transvaal; *O. oblongus* n. sp. on orange-trees in Transvaal; *P. gulos* n. sp. on cotton in Transvaal; *P. compactus* on cotton in Portuguese East Africa; *P. ocularius* on pea-nuts in Transvaal; *P. cognatus* n. sp. on cotton in Portuguese East Africa; *P. gonocnemis* n. sp. on beans in Zululand; *P. crinitus* n. sp. on pea-nuts and cotton in Transvaal; *P. vastator* n. sp. on cotton, tobacco, sweet-potatoes, pea-nuts and maize in Transvaal; *P. latirostris* n. sp. on roses and fruit-trees in Transvaal and in the Orange Free State; *Iphisomus ignawus* n. sp. in Transvaal and in Portuguese East Africa: reported on cotton; *Hodurus dispar* n. gen. and n. sp. in the Orange Free State: reported on lemon-trees; *E. horridus* n. sp. on cotton in Portuguese East Africa; *Dicasticus milanjensis* n. sp. in Nyasaland and Portuguese East Africa: on tea; *Holorygma pilosa* n. sp., in Transvaal: on young lemon plants; *Goniorrhinus hardenbergi* n. sp. on cotton in Portuguese East Africa; *Chalcodermus bondari* n. sp. on cotton in Brazil; *Lophobaris serratipes* n. gen. and n. sp.

raised from pepper seeds in Java: also found in the Malacca Peninsula; *Omoharis calanthes* n. gen and n. sp. on *Calanthe veratrifolia* in Java].

Mcatee, W. L. Names of apple leaf hoppers. *Journal of Economic Entomology*, Geneva, N. Y., 1927, vol. 20, no. 1, pp. 237-238.
[*Typhlocyba*, *Eupteryx* spp.].

Melander, LEONARD W. and CRAIGIE, J. H. Nature of resistance of *Berberis* spp. to *Puccinia graminis*. *Physiopathology*, Lancaster, Pa., 1927, vol. 17, no. 2, pp. 95-114, fig. 1-4.

Miles, HERBERT W. Calcium cyanide as a glasshouse fumigant. *The Scottish Journal of Agriculture*, Edinburgh, 1927, vol. X, no. 1, pp. 60-65.

Miles, HERBERT W. Thrips on orchid seedlings. *The Gardeners' Chronicle*, London, 1927, third series, vol. LXXXI, no. 2093, p. 96.

[Reported as occurring in England and Belgium: *Parthenothrips dracaenae* Heeg, *Heliothrips haemorrhoidalis* Bch., *Thrips tabaci* Lind., *Hel. femoralis*, Rent.; the last species lives on Orchids].

Miller, AUGUST E. A case for the English sparrow as an insect destroyer (Lepidoptera). *Entomological News*, Philadelphia, Pa., 1927, vol. XXXVIII, no. 2, p. 58.

Mordvilko, A. Sur la biologie du phylloxéra de la vigne. Les conditions de sa vie souterraine. L'influence du climat. *Comptes rendus hebdomadaires des séances de l'Académie des Sciences*, Paris, 1927, 1^{er} semestre, tome 184, no 6, p. 343-345.

Newton, MARGARET and Johnson, THORVALDUR. Physiologic forms of wheat stem rust in Western Canada. *Scientific Agriculture*, Ottawa, Ont., 1927, vol. VII, no. 5, pp. 158-161.

[*Puccinia graminis Tritici* (Pers.) Erikss. et Henn.].

NOTES

Phytopathological Questions discussed at the International Conference of Wheat Experts. — This Conference, organised by the International Institute of Agriculture at the suggestion and with the financial help of the Italian Government, fully discussed, among other subjects, various questions connected with the diseases and pests of cereals in general and of wheat in particular.

In this connection the Conference approved the following resolutions :—

(1) There should be kept in each country collections of live plants of native varieties of wheat to provide the material required for genetic, pathological, and ecological research. The list of the varieties grown at each Station should be published in order to facilitate exchanges.

(2) A chain of observation stations should be set up in the physiographic areas based on the principles of agricultural Ecology, with the object of determining the different degrees of productivity and of resistance to unfavourable conditions of environment for the principal wheat varieties.

(3) It is recommended that research work on rusts should be organised in all countries with a co-ordination of the work of plant pathologists and geneticists. Research work and studies on the biological strains of wheat rusts should be developed in the different countries.

In addition, the Conference approved the following recommendations :—

(1) That the attention of the Governments should again be drawn to the serious character of the crop losses caused by weeds and to the desirability of requiring research workers to make a special study of the biology of weeds and to make experiments in the practical means of destroying weeds by cultural, mechanical, or chemical processes.

(2) That the International Institute of Agriculture should encourage, on the part of the Plant Pathology Stations, the institution of carefully supervised comparative trials for ascertaining the substances shewn to be most effective for the control of cryptogamic diseases of cereals and the optimum conditions to be observed in their use.

(3) That the Institute should suggest to the different Governments that research and experimental work be carried out with a view to establishing control measures which, while thoroughly effective against Voles and Locusts, will not involve any danger for animals useful to man.

(4) That studies should be made in the countries concerned for the purpose of discovering effective means of destroying the Hessian fly [*Mayetiola destructor*].

(5) That the Institute should initiate an international enquiry concerning the wheat ravages of Hemiptera of the genus *Eurygaster* and possible control measures.

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